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Reyes et al.

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(54) **SEPARATION OF CARBON DIOXIDE FROM NITROGEN UTILIZING ZEOLITIC IMIDAZOLATE FRAMEWORK MATERIALS**

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(51) **Int. Cl.**

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B01J 8/02	(2006.01)
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C01B 31/20	(2006.01)
C01B 21/04	(2006.01)
C01B 39/02	(2006.01)
C01B 39/04	(2006.01)

(52) **U.S. Cl.** **423/213.2; 423/220; 423/230; 423/235; 423/236; 423/239.1; 423/239.2; 423/700; 423/701; 423/702; 423/704; 423/705; 423/706**

(58) **Field of Classification Search** **423/213.2, 423/220, 230, 235, 236, 239.1, 239.2, 700, 423/701, 702, 704, 705, 706**
See application file for complete search history.

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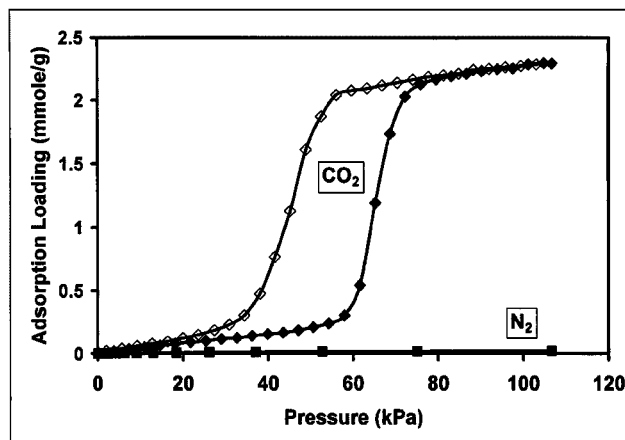
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(57) **ABSTRACT**

The present invention relates to the selective separation of carbon dioxide ("CO₂") from nitrogen ("N₂") in streams containing both carbon dioxide and nitrogen utilizing a zeolitic imidazolate framework ("ZIF") material. Preferably, the stream to be separated is fed to the present process in a substantially gaseous phase. In preferred embodiments, the current invention is utilized in a process to separate carbon dioxide from combustion gas (e.g., flue gas) streams preferably for sequestration of at least a portion of the carbon dioxide produced in combustion processes.

22 Claims, 29 Drawing Sheets



ZIF-7 Isotherms for CO₂ AND N₂ @ 301 K